COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

George Allen
Governor

Becky Norton Dunlop
Secretary of Natural Resources

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
http://www.deq.state.va.us

Thomas L. Hopkins
Director

(804) 698-4000
1-800-592-5482

Certified Mail
Return Receipt Requested

October 28, 1996

C.A. Jake
Alliant Techsystems Inc.
Environmental Manager
Radford Army Ammunition Plant
P.O. Box 1
Radford, VA 24141-0100

RE: Radford Army Ammunition Plant (RAAP)
EPA ID# VA1210020730
Incinerator Spray Pond, Closure Plan Amendment Review

Dear Ms. Jake:

Your letter requesting an amendment to the approved closure plan for RAAP's incinerator spray pond was submitted to the Department of Environmental Quality (DEQ) on October 1, 1996. RAAP submitted this letter in response to the DEQ comment letter dated May 28, 1996.

Based on the information submitted, the amendment requested is approved. An update to Table 3-2 is attached and will need to be added to the closure plan. Please update your closure plan, as needed.

As noted in the amendment request, the analytical method revisions are for soils only. Use of analytical methods with higher quantitation limits for antimony, barium, chromium, lead, mercury, nickel, and thallium are only being approved because the background data indicated the presence of these constituents [Note, future closure plans for other units may not be acceptable with these methods]. Therefore, RAAP will only need to resample background for arsenic, di-n-butyl-phthalate, diethyl phthalate, and resorcinol. Once this resampling is

completed, resubmittal of all background data will need to be submitted to the DEQ in accordance with the closure plan §3.7.1.

As provided in Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date of service of this decision to initiate an appeal by filing a notice of appeal with:

Thomas L. Hopkins, Director
Virginia Department of Environmental Quality
629 East Main Street
P.O. Box 10009
Richmond, Virginia 23240-0009

In the event that this decision is served to you by mail, the date of service will be calculated as three days after the postmark date. Please refer to Part Two A of the Rules of the Supreme Court of Virginia, which describes the required content of the Notice of Appeal, including specifications of the Circuit Court to which the appeal is taken, and additional requirements concerning appeals from decisions of administrative agents.

If you should have any questions, concerning this matter, please contact Debra Miller, Environmental Engineer Senior, of my staff at (804) 698-4206.

Sincerely,

Leslie A. Romanchik

for Thomas L. Hopkins
Director

Attachment

cc: Jerry Redder, Alliant Techsystems-RAAP
Robert Greaves, EPA Region III
Leslie Romanchik, DEQ/Waste-OPM
Lisa Ellis, DEQ/Waste-OPM
Debra Miller, DEQ/Waste-OPM
Glenn VonGonten, DEQ/Waste-GCA
Claire Slaughter, DEQ/Waste-OTA
Aziz Farahmand, DEQ/RRO-Compliance

TABLE 3-2A HAZARDOUS CONSTITUENTS OF CONCERN (Soils Only)		
Contaminant	SW-846 Method	PQL Soil (μg/Kg)
2,4-Dinitrotoluene	8090	130
2,6-Dinitrotoluene	8090	70
Di-n-butylphthalate	8270B	330
Diethylphthalate	8270B	330
Resorcinol	8270B	330
Antimony	7041	1500
Arsenic	6020	200
Barium	6010A	1000
Beryllium	6010A	100
Cadmium	7131	50
Chromium	7190	25000
Lead	7420	50000
Mercury	7471	1000
Nickel	7520	7500
Silver	7761	10
Thallium	7841	500

COMMONWEALTH of VIRGINIA

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Thomas L. Hopkins
Director

(804) 698-4000
1-800-592-5482

August 26, 1996

Ms. C.A. Jake
Environmental Manager
Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114
P.O. Box 1
Radford, Virginia 24141-0100

Re: Equalization Basin
EPA ID# VA12100207306

Dear Ms. Jake:

The Department of Environmental Quality (Department), Office of Permitting Management (OPM) has reviewed your letter dated July 17, 1996, which included a proposed amendment to the closure plan for the above referenced RCRA unit. The Department hereby approves the amendment. A copy of the approved amendment is enclosed.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date of service of this decision to initiate an appeal by filing a notice of appeal with:

Thomas L. Hopkins, Director
Virginia Department of Environmental Quality
629 East Main Street
PO Box 10009
Richmond VA 23240-0009

In the event that this decision is served to you by mail, the date of service will be calculated as three days after the postmark date. Please refer to Part Two A of the

Rules of the Supreme Court of Virginia, which describes the required content of the Notice of Appeal, including specifications of the Circuit Court to which the appeal is taken, and additional requirements concerning appeals from decisions of administrative agents.

If you should have any questions concerning this matter, please contact Khoa Nguyen of my staff at (804) 762-4128.

Sincerely,

Leslie A Romanchik

for Thomas L. Hopkins

Enclosure

c: Robert Greaves (w/o enclosure) - EPA Region III
Khoa Nguyen (w/ enclosure) - VDEQ
Debbie Miller (w/ enclosure) - VDEQ
Claire Slaughter (w/o enclosure) - VDEQ
Mike Scott (w/o enclosure) - WCRO
Central Hazardous Waste Files (w/ enclosure)

Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114
P.O. Box 1
Radford, VA 24141-0100

December 18, 1995

95-815-514

Clifton L. Parker IV
Department of Environmental Quality
Office of Permitting Management, Hazardous Waste
629 East Main Street, Suite 406
Richmond, VA 23219

Subject: Equalization Basin (HWMU 10) Closure Plan
Radford Army Ammunition Plant, Radford Virginia, EPA ID# VA12100207306

Dear Mr. Parker:

Enclosed is the referenced document, both hard copy and electronic, for your approval. The suggested comments and additions incorporated in the document sent to RAAP November 3, 1995 have been reviewed and incorporated into the referenced closure plan. Thank you for extending the due date so that we would be able to complete discussions on the Hazardous Constituents of Concern (HCOC). Your assistance in developing this list has been most beneficial. The enclosed closure plan incorporates the list provided by you December 7, 1995.

As you are aware Norfolk District U. S. Army Corps of Engineers, with a contractor, will be performing the physical work. At this time the Corps is pursuing funding for this project. It is my understanding that they will be able to provide RAAP with a schedule for completion in early January, 1996. Once we receive this schedule we will forward it to DEQ.

If you have any questions concerning the attached information or require additional information please contact either myself (540) 639-8266 or Jerry Redder of my staff (540) 639-7536.

Sincerely

C. A. Jake

C. A. Jake
Environmental Manager

Enclosures

w/o enclosures
c: Mary Beck, EPA Region III
Glen von Gonten, VDEQ
Lisa Ellis, VDEQ
Claire Slaughter, VDEQ
Debbie Miller, VDEQ
West Central Regional Office-Roanoke

W:\815-514

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Permitting Management

Peter W. Schmidt
Director

P. O. Box 10009
Richmond, Virginia 23240-0C
(804) 762-4000

January 2, 1996

Ms. C.A. Jake, Environmental Manager
Alliant Techsystems, Inc.
Radford Army Ammunition Plant
Route 114
P.O. Box 1
Radford, Virginia 24141-0100

SUBJECT: Equalization Basin (HWMU-10) Closure Plan, Radford Army Ammunition Plant, Radford, Virginia, EPA ID# VA1210020730

Dear Ms. Jake:

Radford Army Ammunition Plant submitted Closure, Contingent Closure, and Contingent Post Closure Plans for the Equalization Basin on July 11, 1994. After discussions and a site visit, the Department responded with a revised draft closure plan dated June 23, 1995. Radford's response to the Department was in the form of a redline/strikeout document, received on September 11, 1995. The Department reviewed the submitted draft closure plan, and certain relatively minor clarifications were made to the draft plan, and submitted to Radford for review on November 3, 1995. Additional, comments were discussed including the sludge sampling data for modifications to the constituent list and comments from Mary Beck at the EPA Region III office.

The local Radford newspaper, *The News*, ran a public notice for comment on the closure for the Equalization Basin on May 22, 1995. The period ended on June 22, 1995, and no comments were received during the period.

The latest revised copy of the closure plan was received by the Department on December 19, 1995, and is hereby approved.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date of the service of this decision to initiate an appeal of this decision, by filing a notice of appeal with:

Peter W. Schmidt, Director
Virginia Department of Environmental Quality
ATTN: Waste Division
P. O. Box 10009
Richmond, Virginia 23240-0009

In the event that this decision is served to you by mail, three days are added to that period. Please refer to Part Two A of the rules of the Supreme Court of Virginia, which describes the required content of the Notice of Appeal, including specification of the Circuit Court to which the appeal is taken, and additional requirements governing appeals from decisions of administrative agencies.

If you have any questions about the approval, please contact Clifton Parker[IV] at (804) 698-4142.

Sincerely,

Leslie A. Romanchik

for Peter W. Schmidt
Director

enclosure

cc: Jerome J. Redder, P.E., Alliant Tech Systems (w/enclosure)
Mary Beck, EPA Region III (w/enclosure)
Glenn von Gonten, VDEQ(w/enclosure)
Lisa Ellis, VDEQ
Claire Slaughter, VDEQ
Debbie Miller, VDEQ
Clifton Parker, VDEQ (w/enclosure)
West Central Regional Office - Roanoke (w/enclosure)
Central File (w/enclosure)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Permitting Management

Peter W. Schmidt
Director

P. O. Box 10009
Richmond, Virginia 23240-0C
(804) 762-4000

November 15, 1995

Mr. Jerry J. Redder, P.E.
Environmental Engineer
Alliant Techsystems, Inc.
Radford Army Ammunition Plant
P.O. Box 1
Radford, Virginia 24141-7536

SUBJECT: Incinerator Spray Pond (HWMU-39) Closure Plan Modification
Radford Army Ammunition Plant, Radford, Virginia, EPA ID# VA12100207306

Dear Mr. Redder:

Environmental Resources Management submitted a "variance request", or what is called a "proposed closure plan modification" by VDEQ, for the Incinerator Spray Pond, dated November 9, 1995, and received November 14, 1995. The request to change certain SW-846 analytical test methods from 6020 to an alternate method is acceptable since the 6020 method is not yet widely available; however, certain methods proposed by Radford do not appear to be the lowest practical quantitation limit. A modified list is being submitted to you for your review and consideration, and is attached. Please note that the **bolded** methods and quantitation limits indicate the lowest detection limit(s) which must be used for establishing background, or when necessary during sampling to "see" at or below the required performance standard; (i.e., if the background level or health based number is 100, then any method which can quantify less than 100 satisfies the requirement, otherwise, the lowest detection must be used.)

Please revise the proposed closure plan modification as necessary and resubmit for further review and approval. If there are any questions about this, or if a meeting is needed to discuss closure issues, please do not hesitate to contact me at (804) 762-4142. Please note that VDEQ headquarters' three digit phone number prefix in Richmond will change from 762-, to 698-, on or around December 1, 1995.

Sincerely,

Clifton L. Parker[IV]
Environmental Engineer Senior

Attachment

cc: C.A. Jake, Alliant Techsystems, Radford
C.B. Huggins V, P.G., P.Hg., Branch Manager and Associate, Environmental Resources Management, Inc., 3140 Chapparral Drive SW, Suite 201, Roanoke, Virginia 24018
Robert Greaves, EPA Region III
Glenn von Gonten, VDEQ
Lisa Ellis, VDEQ
Claire Slaughter, VDEQ
Debbie Miller, VDEQ
West Central Regional Office - Roanoke
File

ATTACHMENT

TABLE 3-2 HAZARDOUS CONSTITUENTS OF CONCERN				
CONSTITUENT		SW-846 METHOD	PQL - Target µG/L (WATER)	PQL - Target µG/Kg (SOIL)
1	Antimony	6010A 6020 7040 7041 **7062**	320 0.2 2,000 30 **10**	320 0.2 2,000 30 **10**
2	Arsenic	6010A 6020 **7060A** 7061A **7062**	530 0.2 **10** 20 **10**	530 0.2 **10** 20 **10**
3	Barium	**6010A** 6020 7080A 7081	**20** 0.2 1,000 -	**20** 0.2 1,000 -
4	Beryllium	**6010A** 6020 7090 **7091**	**3** 0.2 50 **2**	**3** 0.2 50 **2**
5	Cadmium	6010A 6020 7130 **7131A**	40 0.2 50 **1**	40 0.2 50 **1**
6	Chromium	6010A 6020 7090 **7191**	70 0.2 500 **10**	70 0.2 500 **10**
7	Di-n-butyl phthalate	8060 **8061** 8250A 8270B 8410	3.6 **3.3** 25 10 -	240 **220** 1,800 - -
8	Diethyl phthalate	8060 **8061** 8250A 8270B	4.9 **2.5** 19 10	330 **170** 1,300 660
9	2,4-Dinitrotoluene	**8090** 8250A 8270B 8330 8410	**0.2** 57 10 0.02 -	**13** 3,800 660 250 -

TABLE 3-2 HAZARDOUS CONSTITUENTS OF CONCERN				
10	2,6-Dinitrotoluene	**8090** 8250A 8270B 8330 8410	**0.1** 19 10 0.31 -	**7** 1,300 660 260 -
11	Lead	6010A 6020 7420 **7421**	420 0.2 1,000 **10**	420 0.2 1,000 **10**
12	Mercury	7470A or 7471A	0.2 0.2	0.2 0.2
13	Nickel	**6010A** 6020 7520	**150** 0.2 400	**150** 0.2 400
14	Resorcinal	8270	100	***
15	Silver	6010A 6020 7760A **7761**	70 0.2 100 **2**	70 0.2 100 **2**
16	Thallium	6010A 6020 7840 **7841**	400 0.2 1,000 **10**	400 0.2 1,000 **10**

Notes: *** indicates not determined, Method 8270 may be used. The detection limit must be consistent with the detection limit of other constituents using this method, and documented through the QA/QC.

The **Bolded** methods and quantitation limits indicate the lowest detection limit which must be used for establishing background, or when necessary during sampling to "see" at or below the performance standard; (i.e., if the background level or health based number is 100, then any method which can quantitfy less than 100 satisfies the requirement, otherwise, the lowest detection must be used.)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Permitting Management

Peter W. Schmidt
Director

November 3, 1995

P. O. Box 10009
Richmond, Virginia 23240
(804) 762-4000

Mr. Jerry J. Redder, P.E.
Environmental Engineer
Alliant Techsystems, Inc.
Radford Army Ammunition Plant
P.O. Box 1
Radford, Virginia 24141-7536

SUBJECT: Bioequalization Basin (HWMU-10) Closure Plan
Radford Army Ammunition Plant, Radford, Virginia, EPA ID# VA12100207306

Dear Mr. Redder:

As you know, Radford Army Ammunition Plant submitted a closure plan for the Equalization Basin to DEQ on July 11, 1994. After discussions and a site visit, the Department responded with a revised draft closure plan dated June 23, 1995. Radford's response to the Department was in the form of a redline/strikeout document received on September 11, 1995. The Department reviewed the submitted draft closure plan, and as we discussed, certain relatively minor clarifications were made to the draft plan; thus, the revised document is attached for your review and comment. A diskette is included containing the document. The disk has been cleaned of the Monkey_B virus. Thank you for the virus warning, and luckly, no computers had become "infected." The document with review comments is also attached for your convienence.

Please submit a revised closure plan within 30 days of recipt of this letter. For your information, the local Radford newspaper, *The News*, ran a public notice for comment on the closure for the Equalization Basin on May 22, 1995. The period ended on June 22, 1995, and no comments were received during the comment period.

If there are any questions about this, or if a meeting is needed to discuss closure issues, please do not hesitate to contact me at (804) 762-4142.

Sincerely,

Clifton L. Parker IV
Environmental Engineer Senior

w/o enclosure
cc: C.A. Jake and Bob Webb, Alliant Techsystems, Radford
Mary Beck, EPA Region III
Glenn von Gonten, VDEQ
Lisa Ellis, VDEQ
Claire Slaughter, VDEQ
Debbie Miller, VDEQ
West Central Regional Office - Roanoke
File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Peter W. Schmidt
Director

SEPTEMBER 15, 1995

P. O. Box 10009
Richmond, Virginia 23240-0009
(804) 762-4000

MS. CAROLYN JAKE, ENVIRONMENTAL MANAGER
ALLIANT TECHSYSTEMS INC.
RADFORD ARMY AMMUNITION PLANT
ROUTE 114
P.O. BOX 1
RADFORD, VA 24141-0100

RE: NOTICE OF STATISTICAL INCREASE AT HWMU 10
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA
EPA ID#: VA1210020730

Dear Ms. Jake:

The Department has received Alliant's notice to the Director of a statistical increase at Radford Army Ammunition Plant's (RAAP) HWMU 10 dated September 8, 1995. Thank you for submitting this notice, in accordance with VHWMR § 9.5.D.4., that RAAP may be affecting ground water quality.

The attached outline for the Ground Water Quality Assessment Plan is acceptable. The Department hereby grants your an extension to the fifteen (15) day time-frame until October 6, 1995, as requested.

If you have any questions, please call Glenn von Gonten of my staff at 804-762-4231.

Sincerely,

Glenn von Gonten

For Howard R. Freeland, C.P.G.
Environmental Program Manager

cc: Joe Wilson, RAAP
Jerry Redder, RAAP
Christel Ackerman, ERM
John Humphries, EPA III
Julia King-Collins, DEQ
Clifton Parker, DEQ
Claire Slaughter, DEQ
Glenn von Gonten, DEQ

ALLIANT TECHSYSTEMS

Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114
P.O. Box 1
Radford, VA 24141-0100

September 8, 1995 95-815-357

if g.w. contamination from this unit confirmed, cannot clean close

Peter Schmidt
Director Virginia Department of Environmental Quality
P. O. Box 1009
Richmond, Virginia 23240-0009

Dear Sir:

In accordance with the Comprehensive Monitoring Evaluation Report delivered to Radford Army Ammunition Plant March 28, 1995 a response was submitted May 30, 1995 which included the Background Calculations for HWMU 10. On August 31, 1995 the statistical analysis for HWMU 10 was submitted using data from 1st Quarter, 1994 data. There were no statistically significant increases that could not be explained for the constituents of concern and therefore RAAP felt that it should remain in detection monitoring.

Since August 31, 1995 RAAP has completed the statistical analysis for the remaining quarters from 1st Quarter 1994 including comparing the detection monitoring parameters.

There are significant increases for specific conductance at HWMU 10. These increases were determined using the ANOVA and CABF Students t-test provided in GRITS/STATS. Mr. von Gonten of your staff recommends that the Average Replicate test be used for this data. At this time our data is formatted to be used in GRIDS/STATS. Transforming the data to accomplish Average Replicate will be time consuming.

Specific Conductivity is affected by metals and metal complexes (salts) present in groundwater. An increase in chloride, sulfate, sodium, and their complexes as seen at HWMU 10 would cause such an increase.

In accordance Virginia Hazardous Waste Management Regulations (VHWMR) 9.5.D.4 the increase in specific conductance places HWMU into Assessment Monitoring. Attached is a summary, well by well, of the statistical exceedances and the outline for the Groundwater Quality Assessment Plan.

According to VHWMR 9.5.D.4.d, a Groundwater Assessment Plan is required within 15 days. RAAP is requesting an extension to October 6, 1995 so that the Groundwater Quality Assessment Plan for HWMU 10 be included in the overall Groundwater Quality Assessment program at RAAP for HWMUs.

If you have any questions please contact Jerry Redder (540) 639 7536 of my staff.

Very truly yours,

for C. A. Jake
Environmental Manager

c: Mr. Glen von Gonten
Virginia Department of Environmental Quality
P. O. Box 10009
629 East Main Street
Richmond, VA 23240-0009

[Mary Beck, EPA]

Christel Ackerman
Environmental Resources Management, Inc.
3140 Chaparral Drive, S. W.
Suite 201
Roanoke, Virginia 24018

Attachment

/JJRedder

WELL	PARAMETER	BKGD	QTR	RESULT
10D3	Barium	29.625	1QTR94	77.00
			2QTR94	59.00
			3QTR94	56.00
			4QTR94	50.00
			1QTR95	50.00
			2QTR95	45.00
10D3	Barium, dis	42.125	1QTR94	75.00
			2QTR94	61.00
			3QTR94	56.00
			4QTR94	60.00
			1QTR95	60.00
			2QTR95	45.00
10D3	Sodium	18875.000	1QTR94	11900.00
			2QTR94	9800.00
			3QTR94	18300.00
			4QTR94	17900.00
			1QTR95	16200.00
			2QTR95	15000.00
10D3	Sodium, dis	22375.000	1QTR94	14000.00
			2QTR94	14000.00
			3QTR94	22000.00
			4QTR94	23300.00
			1QTR95	16200.00
			2QTR95	20000.00
10D3	Specific Cond.	1146.563	1QTR94	827.50
			2QTR94	687.00
			3QTR94	1023.00
			4QTR94	1000.00
			1QTR95	993.00
			2QTR95	1012.00
10D3	pH	7.206	1QTR94	6.98
			2QTR94	7.03
			3QTR94	6.97
			4QTR94	6.83
			1QTR95	7.03
			2QTR95	7.30
10D3	Chloride	25375.000	1QTR94	16000.00
			2QTR94	16000.00
			3QTR94	29000.00
			4QTR94	26000.00
			1QTR95	23200.00
			2QTR95	19000.00

10D3	Sulfate	246250.016	1QTR94	100000.00
			2QTR94	88000.00
			3QTR94	193000.00
			4QTR94	220000.00
			1QTR95	Non-Detec
			2QTR95	180000.00
10D3D	Barium	33.250	1QTR94	37.00
			2QTR94	69.00
			3QTR94	47.00
			4QTR94	50.00
			1QTR95	50.00
			2QTR95	40.00
10D3D	Barium, dis	43.875	1QTR94	31.00
			2QTR94	57.00
			3QTR94	46.00
			4QTR94	50.00
			1QTR95	50.00
			2QTR95	40.00
10D3D	Sodium	14043.750	1QTR94	13500.00
			2QTR94	14800.00
			3QTR94	18100.00
			4QTR94	17500.00
			1QTR95	15800.00
			2QTR95	15000.00
10D3D	Sodium, dis	15812.625	1QTR94	16300.00
			2QTR94	17900.00
			3QTR94	18900.00
			4QTR94	19300.00
			1QTR95	15800.00
			2QTR95	15000.00
10D3D	Specific Cond.	1109.686	1QTR94	820.00
			2QTR94	869.00
			3QTR94	950.00
			4QTR94	960.00
			1QTR95	1020.00
			2QTR95	946.00
10D3D	pH	7.284	1QTR94	7.08
			2QTR94	7.10
			3QTR94	7.02
			4QTR94	6.95
			1QTR95	7.08
			2QTR95	7.29

10D3D	Chloride	21125.000	1QTR94	20000.00
			2QTR94	18000.00
			3QTR94	22000.00
			4QTR94	23000.00
			1QTR95	22600.00
			2QTR95	19000.00
10D3D	Sulfate	218375.000	1QTR94	175000.00
			2QTR94	150000.00
			3QTR94	167000.00
			4QTR94	200000.00
			1QTR95	Non-Detec
			2QTR95	19000.00
10DDH2	Barium	54.250	1QTR94	52.00
			2QTR94	65.00
			3QTR94	30.00
			4QTR94	50.00
			1QTR95	30.00
			2QTR95	76.00
10DDH2	Barium, dis	53.750	1QTR94	51.00
			2QTR94	60.00
			3QTR94	32.00
			4QTR94	50.00
			1QTR95	10.00
			2QTR95	83.00
10DDH2	Sodium	19000.000	1QTR94	14400.00
			2QTR94	11100.00
			3QTR94	14800.00
			4QTR94	17800.00
			1QTR95	25300.00
			2QTR95	21000.00
10DDH2	Sodium, dis	20875.000	1QTR94	13700.00
			2QTR94	13400.00
			3QTR94	18300.00
			4QTR94	22600.00
			1QTR95	25600.00
			2QTR95	23000.00
10DDH2	Specific, Cond.	1139.062	1QTR94	1010.00
			2QTR94	948.00
			3QTR94	719.00
			4QTR94	960.00
			1QTR95	2150.00
			2QTR95	1382.00

10DDH2	Chloride	27375.000	1QTR94	22000.00
			2QTR94	15000.00
			3QTR94	19000.00
			4QTR94	28000.00
			1QTR95	34200.00
			2QTR95	38000.00
10DDH2	Sulfate	368750.000	1QTR94	297000.00
			2QTR94	230000.00
			3QTR94	123000.00
			4QTR94	180000.00
			1QTR95	Non-Detec
			2QTR95	310000.00
10MW1	Specific Cond.	556.875	1QTR94	480.00
			2QTR94	488.00
			3QTR94	485.00
			4QTR94	500.00
			1QTR95	584.00
			2QTR95	555.00
10MW1	Sodium	11725.000	1QTR94	8200.00
			2QTR94	7700.00
			3QTR94	11400.00
			4QTR94	11800.00
			1QTR95	9720.00
			2QTR95	8700.00
10D4	Barium	130.875	1QTR94	105.00
			2QTR94	122.00
			3QTR94	107.00
			4QTR94	110.00
			1QTR95	180.00
			2QTR95	110.00
10D4	Barium, dis	116.750	1QTR94	108.00
			2QTR94	100.00
			3QTR94	102.00
			4QTR94	110.00
			1QTR95	110.00
			2QTR95	110.00
10D4	Sodium	7862.500	1QTR94	5300.00
			2QTR94	8540.00
			3QTR94	6500.00
			4QTR94	6800.00
			1QTR95	8060.00
			2QTR95	6500.00

Draft Outline
Radford Army Ammunition Plant
Ground Water Assessment Plan

1.0 Introduction

- 1.1 Objectives
- 1.2 Data Sources
- 1.3 Report Format

2.0 Hydrogeologic Frame Work

- 2.1 Geologic Setting
- 2.2 Karst Hydrology
  - 2.2.1 Fracture Trace Analysis
  - 2.2.2 Sink Hole Delineation
  - 2.2.3 Dye Trace Results
- 2.3 Occurrence of Ground Water
  - 2.3.1 Alluvium
  - 2.3.2 Bedrock
  - 2.3.3 Water Level Fluctuations
    - Short-term
    - Seasonal
- 2.4 Ground Water Movement (Direction/Velocity)
  - 2.4.1 Flow Direction
  - 2.4.2 Ground Water Velocities
    - Alluvium
    - Karst Bedrock

3.0 Ground Water Monitoring Program

- 3.1 Monitoring Well Network
- 3.2 Analyte Lists

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Permitting Management

Peter W. Schmidt
Director

August 24, 1995

P. O. Box 10009
Richmond, Virginia 23240-000
(804) 762-4000

Mr. Joe D. Wilson, Chief Engineer
Department of the Army
Radford Army Ammunition Plant
Caller Service 2
Radford, Virginia 24141-0298

SUBJECT: Incinerator Spray Pond (HWMU-39) Closure Plan
Radford Army Ammunition Plant, Radford, Virginia
EPA ID# VA12100207306

Dear Mr. Wilson:

Radford Army Ammunition Plant submitted Closure, Contingent Closure, and Contingent Post Closure Plans for the Incinerator Spray Pond on July 14, 1993. DEQ staff comments were provided to Radford via a revised closure plan sent on February 10, 1995. Radford responded to the draft closure plan with comments in a letter dated June 8, 1995. Based on the Department's response to Radford on June 22, 1995, Radford resubmitted the closure plan on July 18, 1995, and again on August 22, 1995. Public notice was advertised in the "*The News*" on May 22, 1995, and the comment period ended on June 22, 1995. No comments were received. The groundwater monitoring plan for this site was conditionally approved by Department letter dated August 17, 1995, upon Radford making appropriate changes and submitting them to VDEQ by September 8, 1995.

The latest revised copy of the closure plan was received by the Department on August 21, 1995, and is hereby approved.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date of the service of this decision to initiate an appeal of this decision, by filing a notice of appeal with:

Peter W. Schmidt, Director
Virginia Department of Environmental Quality
ATTN: Waste Division
P. O. Box 10009
Richmond, Virginia 23240-0009

In the event that this decision is served to you by mail, three days are added to that period. Please refer to Part Two A of the rules of the Supreme Court of Virginia, which describes the required content of the Notice of Appeal, including specification of the Circuit Court to which the appeal is taken, and additional requirements governing appeals from decisions of administrative agencies.

If you have any questions about the approval, please contact Clifton Parker[IV] at (804) 762-4142.

Sincerely,

Hassan Vakili

Hassan Vakili
Director, Waste Operations

cc: Jerome J. Redder, P.E., Alliant Tech Systems (w/enclosure)
Mary Beck, EPA Region III
Glenn von Gonten, VDEQ
Lisa Ellis, VDEQ
Claire Slaughter, VDEQ
Debbie Miller, VDEQ
Clifton Parker, VDEQ (w/enclosure)
West Central Regional Office - Roanoke (w/enclosure)
Central File (w/enclosure)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Peter W. Schmidt
Director

AUGUST 17, 1995

P. O. Box 10009
Richmond, Virginia 23240-000
(804) 762-4000

MR. JERRY REDDER, P.E.
ENVIRONMENTAL ENGINEER
ALLIANT TECH SYSTEMS
P.O. BOX 1
RADFORD, VA 24141-0100

RE: Draft Groundwater Monitoring Plan for the Incinerator Spray Pond and Sampling and Analysis Plan - Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Redder:

The Department has completed it's second review of Radford Army Ammunition Plant's (RAAP) proposed Detection Ground Water Monitoring Program (GWMP) for the Incinerator Spray Pond (HWMU 39) and attached Sampling and Analysis Plan (SAP) submitted on your behalf by Environmental Resources Management, Inc. (ERM). Thank you for submitting these plans. The revised GWMP adequately addressed many of the previously noted deficiencies; however, several remaining issues must be addressed before the plan can be approved.

As before, the Department is providing RAAP with additional comments and guidance below for the few sections of the GWMP which require revisions or additional explanation. Recent input from EPA compels the Department to also require some minor changes in RAAP's Sampling and Analysis Plant (SAP, see Attachment I). Most of the changes in the SAP relate to EPA's guidance that all such plans must contain enforceable language whenever appropriate. For example, the phrase "...shall be..." is preferred because it is considered to be more enforceable.

In addition to the redline/strikeout versions of the SAP, I have included a disk copy for ERM. Please note that the Department is only requiring changes that deal with the text of this document; the "stylistic" changes that are included on both the attachment and the disk copy, such as the doublespacing, font, etc. were

made only to simplify this process. The Department is not requiring any stylistic changes whatsoever.

DETECTION GROUND WATER MONITORING PROGRAM

Section 2.1 - GROUND WATER MONITORING WELL LOCATIONS

COMMENT 1: RAAP's proposed use of the two previously installed monitoring wells cannot be approved until RAAP provides the Department with the relevant well details documented on well boring logs and "as-built" well completion diagrams.

COMMENT 2: The proposed well locations for the proposed downgradient wells should be revised to be sited "hydraulically downgradient at the limit of the waste management area" in order to "immediately detect" a release of hazardous waste or hazardous waste constituents to the uppermost aquifer in accordance with VHWMR § 9.5.B.1.b. One of the present proposed locations is over 100 feet from the spray pond. Monitoring wells should be sited as close to the spray pond as is practical, considering the particular on-site constraints, such as power lines, roads, ditches, etc.

COMMENT 3: The Department recommends that RAAP propose preliminary monitoring well designations at this time to facilitate future discussions.

2.2.1 Soil Boring and Sampling Procedures

COMMENT 4: RAAP indicates in this section and in several other sections that soil cuttings (and decontamination fluids and development/purge water) shall be containerized and stored on-site until properly characterized for disposal. Please specify how RAAP will characterize drill cuttings, development water, purge water, decontamination fluids, and/or pump test water. Drill cuttings and produced ground water are not considered to be a hazardous waste unless it is a characteristic hazardous waste or is mixed with a listed hazardous waste. However, drill cuttings and produced ground water must be properly managed as a solid waste. RAAP must specify how drill cuttings and all produced ground water will be characterized and ultimately disposed of.

COMMENT 5: The GWMP indicates that the cation exchange capacity (C.E.C.) will be determined from a single soil sample. VHWMR § 9.5.B.4. requires that both the C.E.C. and the permeability of soil be determined. Also, please specify that a soil sample will be taken and analyzed from each unit, layer, or

horizon that is encountered rather than just one soil sample, or at least one sample every five feet.

2.2.2 Monitoring Well Construction

COMMENT 6: RAAP indicates that the monitoring wells will be screened from 10 to 25 feet below the water table (approximately 20 to 35 feet below grade. Unless RAAP is able to document large seasonal water table fluctuations, please revise this section to specify that the screens shall be no longer than 10 feet in length and shall be installed to straddle the uppermost aquifer, as determined in the field.

COMMENT 7: Please add a text that specifically states that glues or solvents shall not be used during the well installation.

COMMENT 8: Please change the text to specify that the bentonite seal will be allowed to sit until "adequately" hydrated", rather than only one hour to ensure that the seal has had sufficient time to completely hydrate.

COMMENT 9: The GWMP indicates that a "two-foot by two-foot concrete surface pad" will cap each well. The TEGD recommends that facilities install a four-inch thick apron with a three-foot radius, while the more recent Draft Technical Guidance (EPA 1992) indicates that a two-foot by two-foot apron is adequate. RAAP fairly recently rebuilt many of it's monitoring well aprons to approximately six-foot by six-foot; the Department recommends that RAAP specify the larger aprons for the spray pond as well, in order to maintain consistency with the previously installed monitoring wells. The Department strongly suggests that RAAP not specify the smaller two-foot by two-foot aprons because they may not adequately meet the performance standards of protecting the well head and preventing infiltration of surface water or contaminants directly into the bore-hole area. Also, please specify that the aprons will be "crowned" to facilitate surface water run-off.

COMMENT 10: The GWMP states that "The elevation of each PVC well casing will be referenced from an established and documented point on top of the PVC well casing." If the protective steel casing extends above the PVC well casing, then the steel casing may be a more convenient reference point than the PVC casing would be. RAAP should consider specifying that the protective steel casing will be surveyed rather than the top of the PVC casing.

2.3 DETERMINATION OF AQUIFER CHARACTERISTICS

COMMENT 11: RAAP indicates that slug tests shall be conducted on the three new monitoring wells. If the previously installed monitoring wells are acceptable to the Department, then RAAP should consider the merits of conducting slug tests on these older wells in addition to the new wells.

COMMENT 12: Because of the lack of detailed site-specific geologic/hydrogeologic data, RAAP should also consider the advantages in performing other analytical tests in order to characterize the uppermost aquifer, such as taking whole cores, and determining the mineralogy, crystallography, sorting and size fraction, transmissivity, porosity, etc.

COMMENT 13: Please specify that the initial ground water contour map for the site will be based on data collected within a single 24 hour period.

3.3 STATISTICAL EVALUATION OF GROUND WATER MONITORING DATA

COMMENT 14: The incinerator spray pond is an interim status unit; therefore, RAAP must use a Student's t-test (as noted in the discussion). However, Student's t-test included in the GRITS/STAT package is the **CABF** t-test which the Department does not recommend. It may be advantageous for RAAP to use a spreadsheet or other software package to perform the Averaged Replicate (AR) analysis of the background data. If the Averaged Replicate (AR) analysis indicates a statistical increase and RAAP believes that this is in error, then RAAP may submit additional statistical analyses to make this demonstration. RAAP should change this section to indicate that in accordance with VHWMR, the analytical data shall be analyzed using the Average Replicate Student's t-test. Although RAAP may use the GRITS software package, it's use may not be appropriate in this section.

SAMPLING AND ANALYSIS PLAN

APPENDIX I

COMMENT 15: On March 28, 1995 (1994 CME) and April 20, 1995 the Department provided RAAP with revised and approved Ground Water Monitoring Lists. Although the SAP was revised to include the Department's monitoring lists, RAAP has made some of the modifications which the Department cannot accept. RAAP's modifications deleted certain constituents and footnotes which the Department requires. The monitoring lists may not be modified without prior approval from the Department. Although RAAP is not <u>presently</u> required to sample for certain constituents, RAAP may be required to sample for these

constituents during the final closure, post-closure permitting process, and/or ground water quality assessment program. Specifically, I am referring to those redlined constituents identified in footnote 5 of each of the Department's approved Ground Water Monitoring Lists of March and April. Please use the attached Ground Water Monitoring Lists (Attachment II) when revising the SAP. Minor formatting changes may be acceptable, but all of the specified constituents must remain on the lists until the assessment is completed and the Department approves their removal.

The Department is committed to helping RAAP meet it's Detection Ground Water Monitoring Program obligations for HWMU 39 in a timely and cost-effective manner. However, nothing in this review is intended to, or should be construed as authorization to delay or otherwise avoid compliance with the VHWMR. Please note that a Ground Water Monitoring Program is required by the VHWMR and must continue until clean closure is achieved for both soils and ground water or until the end of any post-closure care period, if required.

The Department is conditionally approving the proposed Ground Water Monitoring Program for the Incinerator Spray Pond (HWMU 39). It is conditional upon RAAP making the appropriate changes and submitting them to the Department by September 8, 1995. RAAP should begin the installation of the monitoring wells by October 15, 1995. Because the required revisions to the Sampling and Analysis Plan are clerical in nature, the Department is also conditionally approving it as well. Please submit the revised SAP by September 8, 1995. In order to expedite the revision process, RAAP should submit a disk copy of the revised plans as well.

Waste Operations has relocated from our Innsbrook offices. Please address all correspondence to:

Department of Environmental Quality
P.O. Box 10009
Richmond, Virginia 23240-0009

Packages may be sent to:

Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Please call me if you have any questions at my new phone number (804-762-4231, fax-762-4327) if you have any questions or

comments concerning this review and the requirements for a Detection Ground Water Monitoring Program and/or Sampling and Analysis Plan.

Sincerely,

Glenn von Gonten
Geologist Senior

Attachments (2)

cc: Joe Wilson, RAAP (without attachment)
Crystal Ackermann, ERM (with attachment)
John Humphries, EPA (without attachment)
HW FILES, (with attachment)
Norm Auldridge, DEQ (without attachment)
Howard Freeland, DEQ (without attachment)
Clifton Parker, DEQ (with attachment)
Leslie Romanchik, DEQ (without attachment)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Permitting Management

Peter W. Schmidt
Director

P. O. Box 10009
Richmond, Virginia 23240-0009
(804) 762-4000

August 31, 1995

Mr. Joe D. Wilson, Chief Engineer
Department of the Army
Radford Army Ammunition Plant
Caller Service 2
Radford, Virginia 24141-0298

SUBJECT: Bioequalization Basin (HWMU-10) Closure Plan
Radford Army Ammunition Plant, Radford, Virginia
EPA ID# VA12100207306

Dear Mr. Wilson:

During the week of August 29, 1995, the use of a coal combustion by-product was discussed for use as a stabilization agent during the closure of the bioequalization basin between VDEQ and Radford representative Jerry Redder, P.E. This letter approves the use of fly ash to be used in stabilizing the bioequalization basin sludges for removal as described in the draft closure plan.

Although the closure plan is still in draft form, the Department approves of the disposal of the hazardous waste liquids and sludges from the basin in accordance with the draft closure plan. Please note that equipment used during stabilization will need to be decontaminated once it has contacted the sludges, and that all decontamination, site safety and health, and waste characterization methods which are discussed in the draft closure plan should be employed during this waste removal phase of closure.

If there are any questions about this, please do not hesitate to contact Clifton Parker at (804) 762-4142.

Sincerely,

Hassan Vakili

Hassan Vakili
Director, Waste Operations

cc: Jerome J. Redder and Bob Webb, Alliant Tech Systems, Radford
Shelly Barker and Bob Richardson, US Army, Radford
Mary Beck, EPA Region III
Glenn von Gonten, VDEQ
Lisa Ellis, VDEQ
Debbie Miller, VDEQ
Claire Slaughter, VDEQ
West Central Regional Office - Roanoke
Central File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Peter W. Schmidt
Director

P. O. Box 10009
Richmond, Virginia 23240-00(
(804) 762-4000

August 30, 1995

MS. CAROLYN JAKE, ENVIRONMENTAL MANAGER
ALLIANT TECHSYSTEMS INC.
RADFORD ARMY AMMUNITION PLANT
P.O. BOX 1
RADFORD, VA 24141-0100

RE: RAAP EXTENSION REQUEST
EPA ID NO. VAD 1210020730

Dear Ms. Jake:

The Department has reviewed your request to extend the due date for the Ground Water Quality Assessment Plan until October 6, 1995 based on the difficulty in obtaining the historical groundwater data and sampling and analysis concerns. The Department grants the extension to October 6, 1995 as requested.

However, RAAP has not completed the requirements of VHWMR §9.5.D for HWMU 10. RAAP must statistically determine after each sampling event whether there is (and whether there was after previous sampling) any statistically significant increases over background. RAAP has submitted the required background statistics for HWMU 10, but has not submitted the determination(s), and required notices, pursuant to VHWMR §9.5.D.4. that a release from HWMU 10 may have occurred.

To summarize, the Department is extending the due date for the Ground Water Quality Assessment Program until October 6, 1995. However, this extension does not apply to the statistical determination for HWMU 10 which was due June 1, 1995. Please submit the required statistical comparisons no later than October 6, 1995.

Please let me know if you have any questions about this letter or the Department's requirements for resolving the issues concerning HWMU 10. I can be reached at 804-762-4231; if I am unavailable please contact Howard Freeland at 804-762-4219.

Sincerely,

Howard R Freeland

for Glenn von Gonten
Geologist Senior

cc: Joe Wilson, RAAP
Jerry Redder, RAAP
John Humphries, EPA III
Howard Freeland, DEQ
Leslie Romanchik, DEQ
Norm Auldridge, DEQ

ALLIANT TECHSYSTEMS

Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114
P.O. Box 1
Radford, VA 24141-0100

August 15, 1995 95-815-316

Department of Environmental Quality
3035-E Peters Creek Road, NW - Suite D
Roanoke, VA 24019

Attention: Mr. Thomas L. Henderson, Regional Director

Subject: 2,4, DNT Entering EQ Basin

Dear Mr. Henderson:

On August 9, 1995, approximately 2,000 gallons of wastewater entered the old Equalization Basin at our Biological Treatment Plant. This was originally reported to Mr. Mike Scott, Waste Division, and Mr. Lewis Pillas, Water Division on August 11, 1995 after our Environmental Department was informed of this event by the subcontractors pumping the equalization basin for off plant treatment.

The incident occurred at approximately 3:30 pm Wednesday, August 9, 1995 for about 5 minutes. A Corps of Engineers' contractor working on the bioplant expansion was excavating a trench and inadvertently severed a buried air line that supplied instrument air to the level detector in the bar screen pump tank. When the level detector lost instrument air, it read that the bar screen pump tank was empty and shut the pumps down. Wastewater flowed over the bar screen pump tank into the old equalization basin. The Biological Treatment Plant operator noticed the problem and manually closed the inlet valve. The air line was repaired and the pumps were reactivated.

All of the wastewater entered the old Equalization Basin which is lined with one-foot thick soil cement. No hazardous waste was spilled on the ground or entered a stream or any other water source. At no time was there any threat to human health or the environment. The water is currently being pumped out of the basin along with the existing equalization basin material.

The wastewater was reported as 0.05 ppm 2,4 DNT based on a 24-hour composite sample taken on August 9th. The composite sample was taken at the pump station prior to entering the temporary equalization tanks. RAAP's on-plant laboratory used Liquid Chromatography to analyze the wastewater. However, due to a confusion of the sampling date versus the analytical test date, it was later discovered that the sample taken August 9th actually contained 0.135 ppm 2,4 DNT. There is no data available on the pump screen wastewater, but we feel the composite sample is a good indication of the flow that entered the equalization basin.

Copy of this
page faxed
to Bob
8/16/95

We will be meeting with Corps of Engineers' contractor to discuss methods to prevent any further disruption of the Biological Treatment Plant during the final stages of the expansion project. If you have any questions please contact Jerry Redder (540-639-7536), or Cybele Lane (540-639-8302).

Very truly yours,

C. A. Jake
Environmental Manager

c: Mike Scott
Virginia Department of Environmental Quality
Waste Regional Office
Brammer Village
3035-E Peters Creek Road, NW
Roanoke, VA 24019

Lewis Pillis - DEQ Roanoke
VA Department of Environmental Quality
Water Division
3015 Peters Creek Road
P. O. Box 7017
Roanoke, VA 24019

Mary Beck - EPA Region III
U. S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19109-4431

JJRedder:gps

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Permitting Management

Peter W. Schmidt
Director

P. O. Box 10009
Richmond, Virginia 23240-0
(804) 762-4000

August 3, 1995

Mr. Joe D. Wilson, Chief Engineer
Department of the Army
Radford Army Ammunition Plant
Caller Service 2
Radford, Virginia 24141-0298

SUBJECT: Bioequalization Basin (HWMU-10) Closure Plan
Radford Army Ammunition Plant, Radford, Virginia
EPA ID# VA~~12100207306~~
1210020730

Dear Mr. Wilson:

This letter is in response to questions raised during the July 26, 1995, conference call between DEQ and Radford staff over the Bioequalization Basin Closure Plan which was submitted to Radford in draft form. The three primary issues which the Department intends to clarify are disposal of materials as either hazardous or solid wastes, procedures for decontamination, and health based performance standards for the purpose of attempting clean closure of soils.

First, the Department agrees that during a clean closure attempt for soils, some of the materials removed may meet the definition of hazardous wastes, some may be solid wastes, and others left in place as "statistically clean" to background or health based standards.

During the closure of the bioequalization basin, the waste water removed from the surface impoundment is a solid waste, but may also meet the definition of hazardous waste. As the K044 sludges that were contained in the Bioequalization Basin are listed because they are wastewater treatment sludges that exhibit the characteristic of reactivity, the wastewaters will not be listed hazardous waste as they do not meet the K044 listing. If the waste water exhibits a characteristic of hazardous waste, the waste water must be treated and disposed in accordance with the Virginia Hazardous Waste Management Regulations. Such treatment may consist of discharge to a permitted waste water treatment facility which is permitted under the Clean Water Act to accept the type of constituents found in the waste water. The proposed list of constituents relevant to the bioequalization basin are listed in Table 2-1 in the draft closure plan. Of course, the constituent list will be finalized for inclusion in the approved closure plan.

The sludges accumulated in the surface impoundment are hazardous waste as long as they meet the K044 hazardous waste listing (i.e., they are wastewater treatment sludges from the manufacturing and processing of explosives) or if they exhibit a characteristic of hazardous waste in accordance with VHWMR Part III. If the sludges meet the listing as K044 listed hazardous waste, or exhibit a characteristic of hazardous waste, they must be disposed of as hazardous waste.

The soil/cement liner and underlying subsoils are not necessarily hazardous waste - these materials will be hazardous waste if they exhibit a characteristic of hazardous waste in accordance with VHWMR Part III (i.e., ignitability, corrosivity, reactivity and/or toxicity). If the debris does not exhibit a characteristic of hazardous waste, it must be disposed of as special wastes in a solid waste landfill in accordance with the special waste regulations in the Virginia Solid Waste Management Regulations. The Department recommends containing similar materials together in roll-off containers for disposal, i.e., the soil/cement liner should be excavated, containerized, and characterized separately from the underlying soils. Likewise the underlying soils can be excavated, containerized, and characterized by lifts for disposal during the clean closure attempt. For the bioequalization basin, characterization of wastes must be performed to determine if the material excavated is a hazardous waste. Please note that hazardous and solid waste handlers will also require testing information to satisfy land disposal restrictions (LDR) and/or compliance with the accepting landfill's permit conditions. Note that the accepting hazardous waste TSD may perform confirmatory testing on the incoming waste. Since the constituents in the basin sludges may exhibit a characteristic of hazardous waste in addition to meeting the K044 listing, these sludges should additionally be characterized for the toxicity characteristic (for example: 2,4-DNT, arsenic, and lead), in addition to applying the hazardous waste listing. A representative sample of the waste must be tested for constituents levels of all applicable toxicity characteristic constituents. The applicable constituents are those which are both a hazardous constituent of concern as defined in the "yet to be approved" closure plan and listed on Table 3-2 in the VHWMR. Additionally, for disposal purposes, the waste must be shown not to have the characteristic of ignitability or corrosivity as outlined in §§ 3.6 and 3.7 of the VHWMR, although a generator may use his knowledge of the waste to make this determination. If the representative sample from the roll-off container (or other container), which represents the material being excavated, is found to be hazardous, then the container must be transported to a permitted RCRA hazardous waste treatment, storage, or disposal facility by a permitted hazardous waste transporter. Otherwise, the waste may be disposed of in accordance with the VSWMR.

Please be aware, however, that the issue of whether or not underlying soils exhibit a characteristic of hazardous waste is separate from the issue of whether or not these same soils are able to be "clean closed". The characteristics of hazardous waste do not come into play during a clean closure attempt. Total levels (not TCLP levels) of all the constituents listed in Table 2-1 in the draft closure plan statistically compared to background or health-based cleanup standards will determine whether the unit soils have been clean closed.

Secondly, for Radford to keep ancillary structures from the bioequalization basin as clean items ready for salvage, reuse, disposal, etc., then Radford must show that the item has been properly decontaminated. These ancillary items include sampling tools, excavation equipment, workers' clothing, as well as pipes, pumps, concrete, flow gates, and etc.

Currently the draft version of both the incinerator spray pond and the bioequalization basin closure plans describe the decontamination of all materials in section 3.9.3:

> All non-disposable sampling equipment will be decontaminated between each sample. Those sampling implements which cannot be decontaminated effectively will be containerized and properly disposed of based on sample analytical results.
>
> The decontamination of sampling equipment (hand auger, scooplula, trowel, etc.) will be performed as follows, which follows the decontamination procedures for sampling

equipment (EPA Region IV, Standard Operating Procedures and Quality Assurance Manual, 1986,):

1. Clean with tap water and a soap solution (A phosphate-free laboratory detergent such as Alconox, Aliquinox, Liquinox will be used for cleaning) using a brush if necessary to remove particulate and surface films.
2. Rinse thoroughly with the Radford's potable water.
3. Rinse thoroughly with deionized water.
4. Rinse thoroughly with organic-free water and allow to air dry as long as possible. If organic-free water is not available, allow equipment to air dry as long as possible. Do not rinse with distilled or deionized water.
5. Wrap with aluminum foil, if appropriate, to prevent contamination if equipment is going to be stored or transported.

All rinseate waters will be contained and analyzed for the constituents of concern prior to discharge. Disposal of rinseate will be performed based on sampling results and in accordance with the VHWMR. All sampling equipment will be decontaminated prior to sampling, between sample depths, and between samples unless new or dedicated (i.e, used only for one sample) equipment is used. Sampling equipment will be disposed of as hazardous waste at the conclusion of the sampling program, where appropriate.

Large equipment used for closure activities will be cleaned prior to its use on site. The decontamination of the larger sampling equipment will occur in a temporary constructed decontamination area. A 20-ft x 30-ft area will be graded with at least a 2% slope towards one corner of the area. The area will be lined with an appropriate plastic liner to prevent infiltration of decontamination water into the soils. The area will drain into a polyethylene container. Rinseate and other wastes generated during decontamination will be placed into 55 gallon drums. This proposed decontamination area has been designed so as not to meet the definition of a surface impoundment. Following closure, the large sampling equipment will be decontaminated using steam cleaning followed by a potable water rinse.

All wastes generated during the decontamination process will be accumulated in 55 gallon drums for less than 90 day accumulation.

The decontamination area's synthetic liner will be disposed of in accordance with the VHWMR and VSWMR. If analytical results show the liner is a hazardous waste by characteristic, then the liner will be transported via a Virginia permitted hazardous waste transporter and disposed of off-site at a permitted or interim status hazardous waste treatment, storage, or disposal facility. If it is not hazardous, it will be disposed of in a permitted solid waste landfill as a special waste in accordance with the VSWMR.

The rinseate collected during the decontamination process will be transferred to 55-gallon drums or other containers meeting the requirements of VHWMR §6.4 for accumulation until test results are received (but in no case greater than 90 days). If the waste water in the drums exhibits a characteristic of hazardous waste, it will be accumulated in accordance with VHWMR § 6.4.E., and either transported via a Virginia permitted

hazardous waste transporter and disposed of off-site at an approved hazardous waste facility or it will be disposed of in the biological waste water treatment plant with VDEQ approval. If the waste water is non-hazardous, it will go to the waste water treatment plant. Equipment blanks will be collected for decontamination quality control.

The methodology quoted above assumes that the cleaning method has adequately decontaminated the items in question, and assumes a specific cleaning method; however, other decontamination methods may utilize different cleaning methods. Another closure plan, already approved by VDEQ, describes the process of decontaminating equipment as follows:

Prior to the initiation of the physical closure work, personnel and equipment decontamination areas and facilities shall be established and constructed adjacent to and contiguous with the remediation area. The decontamination area shall be large enough to facilitate equipment and worker decontamination activities. The runoff catchment area shall be constructed such that it will not permit runoff from the decontamination operations to run onto the ground. Three separate distinct areas within the decontamination area shall be established to control and separate runoff. These areas shall be for cleaning, rinsing, and final rinsing of closure equipment and personnel. Each of the three areas within the decontamination area shall be sloped to drain to a low point where vacuum pumps shall be used to pump runoff from the containers into separate 55-gallon drums. Waste staging and decontaminated equipment holding area shall be designated immediately adjacent to the decontamination area. Small equipment (i.e., tools, sampling devices, etc.) which have undergone decontamination, along with containers of waste material incidental to the decontamination work shall be stored at these locations awaiting laboratory analysis results and appropriate disposition. Laboratory analysis turnaround times shall be as expedient as possible but in no case shall any waste be accumulated on site for longer than 90 days.

Workers and small equipment (i.e., tools, sampling equipment) shall decontaminated in the personnel decontamination area. Personnel shall decontaminate small equipment, pass them through to appropriately protected persons within the rinse area, shall remove contaminated clothing and enter the rinse area. Workers and small equipment shall then be rinsed and cross into the final rinse area. Within the final rinse area, small equipment shall be rinsed, workers will don clean clothing and exit the decontamination area. The small equipment will be stored at the predesignated location, allowed to air dry, and workers shall proceed to the nearest shower facility for full body decontamination. Personnel shall decontaminate after each work period. Small equipment shall be decontaminated after each work shift. Sampling equipment shall be decontaminated after each sample location.

Heavy construction equipment such as backhoes and blades (if used) in the closure work shall be moved into a large decontamination area and will be decontaminated by high pressure steam cleaning and rinsing with the appropriate water/condensate decontamination mixture. Two additional cleanings of the equipment shall be performed

using the same methods and procedures. The equipment shall then be visually inspected. If necessary, the equipment shall be recleaned. Upon decontamination, the equipment shall be moved to the immediately adjacent predesignated holding location awaiting laboratory analysis results and appropriate disposition. Proper decontamination shall be achieved when the final rinse water is analyzed and the levels are not statistically significant when compared to the pre-rinse water using the statistical method outlined in EPA SW-846, third edition (1986) as updated, Chapter 9, using a 95% confidence level.

All wastewater resulting from the decontamination operations shall be vacuum pumped from the decontamination containers into 55-gallon drums or a vacuum truck. All liquids will be treated on site at the industrial wastewater treatment plant or otherwise handled in accordance with the VHWMR.

Proper decontamination of the closure equipment will be achieved when the final rinse water from each decontamination operation is analyzed for the constituents outlined in the closure plan and compared to pre-rinse water using the statistical method outlined in EPA SW-846, Test Method for Evaluating Solid Wastes, third edition (1986) as updated, Chapter 9, using a 95% confidence level. If proper decontamination of the facility components and closure equipment cannot be achieved, they will be characterized and disposed of in accordance with the VHWMR and VSWMR. At the conclusion of the closure work, the small equipment and personnel decontamination area liner and holding structure shall be dismantled, properly characterized and disposed of in accordance with the VHWMR and VSWMR.

The third issue which was briefly discussed during the conference call was the use of health based clean closure performance standards. Currently the draft closure plan specifies that if the subsoils cannot feasibly be shown to have statistically less than or equal to background levels of constituents, then the facility can attempt a clean closure by use of health based standards. Thus, Radford may begin negotiating health based clean closure performance standards as soon as the analytical data are available. However, as stated in the draft closure plan, changing the performance standards from background to health based standards requires a closure plan modification. There are two main reasons for this approach. First, the subsoil conditions will be unknown until they are unearthed and tested, i.e., Radford may find that the contamination in the subsoil is such a large volume that it is economically not feasible to continue excavation and disposal of the contaminated materials. Secondly, the number of hazardous constituents of concern which will be used in a health based clean closure determination will depend on how many constituents are eliminated during the clean closure attempt to background. For example, if there are 20 constituents in a clean closure attempt, and the facility excavates subsoils until background levels are reached for all but 4 constituents, then health based numbers can be negotiated based on the remaining 4 constituents, which are statistically above background levels.

Please revise the draft plan to fit the conditions at your facility. Radford may excerpt text from either of the passages above on decontamination or re-draft the procedures completely to satisfy the decontamination requirements for ancillary materials found at the bioequalization basin closure site. The Department looks forward to reviewing the changes which were discussed during the July 26, 1995, conference call, and expects the revised document to be submitted within (10) days from receipt of this letter for further review.

If there are any questions about this, or if another conference call is needed to discuss closure issues, please do not hesitate to contact me at (804) 762-4142.

Sincerely,

Clifton L. Parker[IV]
Environmental Engineer Senior

cc: Bob Richardson, US Army, Radford
Jerome J. Redder and Bob Webb, Alliant TechSystems, Radford
Gordon Chancey, P.E., [send to: Commander Army Engineer District, ATTN: CENAO-EN-CE (Gordon Chancey), 803 Front Street, Norfolk, Virginia 23510-1096]
Mary Beck, EPA Region III
Glenn von Gonten, VDEQ
Lisa Ellis, VDEQ
West Central Regional Office - Roanoke
Central File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Permitting Management

Peter W. Schmidt
Director

June 22, 1995

P. O. Box 10009
Richmond, Virginia 23240-0009
(804) 762-4000

Mr. Joe D. Wilson, Chief Engineer
Department of the Army
Radford Army Ammunition Plant
Caller Service 2
Radford, Virginia 24141-0298

SUBJECT: Incinerator Spray Pond (HWMU-39) Closure Plan
Radford Army Ammunition Plant (Radford), Radford, Virginia
EPA ID# VA12100207306

Dear Mr. Wilson:

The Department is in receipt of review comments dated June 8, 1995, which are in response to the DEQ draft closure plan for the Incinerator Spray Pond, which was dated February 10, 1995. On June 12, 1995, the following comments were discussed briefly with Jerry Redder. A detailed response follows. Radford comments are italicized, and the Department's response follows.

1. *Page 17 & 18 paragraph 3.5.1 Hazardous Constituents of Concern*

Comment:
Testing for organics from the scrubber water from the incinerator is redundant. The incinerator is 99% efficient. The organics were treated in the incinerator and are not in the spray pond. The sludge that was removed from the pond tested positive only for lead. Also, is there a reason for 2,4 DNT and 2,6 DNT to be listed twice?

DEQ response:

Organic constituents from the incinerator are materials which could have possibly entered the spray pond water during the incinerator's operating lifetime; therefore, these constituents may have leached into the subsoils. In order for this site to be considered statistically clean, Radford must demonstrate that no contamination has been left in-place by testing for all hazardous constituents of concern which include the organics as well as the metals. On May 25, 1995, Radford was faxed a new hazardous constituent of concern list which included new practical quantitation limits and deleted the DNT double entry. Please note that the closure plan allows Radford to stop testing for a constituent during the clean closure attempt once the soil has been found to be statistically clean for the particular analyte; therefore, if a particular constituent is not found in the first round of sampling, Radford could cease sampling for the particular analyte. Please note that the practical quantitation limit for certain constituents has been lowered due to

a new analytical chemistry technique and the VHWMR requires that the test with the lowest detection limit be used. Note that once background is established, a test method with a detection limit higher than the lowest possible, but less than the background limit can be used to reduce analytical cost. A revised constituent list follows for the incinerator spray pond closure plan:

TABLE 3-2 HAZARDOUS CONSTITUENTS OF CONCERN

Contaminant	SW-846 Method	PQL Water (μg/L)	PQL Soil (μg/Kg)
2,4-Dinitrotoluene	8090	0.2	13
2,6 Dinitrotoluene	8090	0.1	7
Di-n-butylphthalate	8061	3.3	220
Diethylphthalate	8061	2.5	170
Resorcinol	8270	100	_
Antimony	6020	0.2	0.2
Arsenic	6020	0.2	0.2
Barium	6020	0.2	0.2
Beryllium	6020	0.2	0.2
Cadmium	6020	0.2	0.2
Chromium	6020	0.2	0.2
Lead	6020	0.2	0.2
Mercury	7470 or 7471	2	2
Nickel	6020	0.2	0.2
Silver	6020	0.2	0.2
Thallium	6020	0.2	0.2

2. *Page 16 paragraph 3.3 General Closure Approach*

Closure plan states:
Rainwater has filled the pond since it was emptied in 1992.

Proposed change:
To ensure compliance with the VPDES permit, analysis will be performed for COD, Lead, and pH. Additional testing would not warrant any value for the money spent.

DEQ Response:

To ensure compliance with hazardous waste generator requirements, it is up to the facility to adequately characterize the waste in accordance with VHWMR § 6.1. The generator may characterize his waste through analytical testing or knowledge of the waste. If based on the facility knowledge of the waste, Radford is comfortable with performing only analyses for COD, lead and pH in order to properly characterize the waste, DEQ accepts this proposal.

3. *Page 18 paragraph 3.5.2 development of Cleanup Targets*

Proposed Change:
RAAP will submit a revised Figure 2.5 describing background sampling locations. This figure will be submitted with the Groundwater Monitoring Plan due to DEQ July 1, 1995.

DEQ response:

Ok.

4. *Page 19 paragraph 3.6.2 Concrete Liner and Bedding Material Removal*

Closure Plan states:
Concrete and bedding material will be taken and tested for hazardous characteristic in accord with VHWMR Part III, and that concrete and bedding material will be disposed of in a permitted debris landfill.

Proposed Change and Comment:
The sludge was hazardous for lead (D008). Testing the concrete and bedding material for lead is sufficient for a hazardous determination. Concrete and bedding material, that is analyzed to be not hazardous, should be disposed of in accordance with VSWMR."

DEQ Response:

The concrete liner, bedding materials, and any soils excavated during closure may be disposed of in a permitted debris landfill if the materials are non-hazardous. If the materials are hazardous for lead (D008), then the materials must be disposed of in a permitted hazardous waste facility. No concrete or bedding materials from this hazardous waste closure site may go into an unpermitted rock fill. The Department realizes that the VSWMR does not manage stones, concrete chunks, and boulders as a solid waste; and thus, unregulated "rock" material may be used as fill or rip-rap according to the VSWMR. However, materials from this closure are inherently waste like; and thus, a discarded material. A solid waste is any discarded material according to § 3.1.A., VSWMR Amendment 1. Therefore, the materials are solid waste and must be managed as a minimum of disposing of in a permitted debris landfill. If the materials exhibit a hazardous characteristic, then they must be disposed of in a permitted hazardous waste storage, treatment, or disposal facility.

5. *Page 27 paragraph 3.7.3 Initial Physical Observation of Subsoils and Excavation*

Comment:
RAAP plans to use X ray fluorescence. If DEQ does not approve of this method of physical sampling please indicate.

DEQ Response:

DEQ approves of the use of X-Ray Fluorescence techniques to extend the ability to quickly detect contamination for removal. Obviously, the sampling and analysis are the definitive measure of clean or not clean once contamination has been removed. Please revise the closure plan to describe how this method will be used in conjunction with sampling and analysis.

6. *Page 28 paragraph 3.7.4 Initial Random Sampling and Excavation*

Plan States:
Surface samples will be collected using disposable stainless steel hand corers.

Proposed Change:
Surface samples will be collected using stainless steel hand corers.

DEQ Response:

Ok.

7. *Page 30 paragraph 3.7.5*
Plan States:
Discuss Health Based Closure

Proposed Change:
RAAP will propose risk/health based closure criteria.

DEQ Response:

Ok.

8. *Page 31 paragraph 3.8.1 Sample Preservation and Maximum Holding Times*

Plan States:
Organic tests 4 ounce, (120ml) wide mouth glass with teflon liner

Proposed Change:
Organic tests 4 ounce, (120ml) wide mouth glass with teflon lined lid

DEQ Response:

Ok.

9. *Page 40 paragraph 3.11 Groundwater Closure*

Proposed Change:
Delete paragraph in its entirety. The Groundwater Monitoring and closure plan currently under review by Glenn von Gonten, DEQ Hydrogeologist, should be referenced in this paragraph.

DEQ Response:

A groundwater monitoring plan is required for all landbased units. Closure requires that criteria be used to establish what clean or not clean is, and how "clean-closed" will be established. These paragraphs cannot be deleted from the closure plan according to VHWMR § 9.6.B. The section can be revised however, to delete any references to specific statistical procedures, and revised as follows:

3.11 Groundwater Closure

Groundwater will be monitored in accordance with the Groundwater Monitoring Plan (as updated) until:

- "Clean" closure for both saturated soils (groundwater) and unsaturated soils (the incinerator spray pond subsoils) have been demonstrated; or,
- A post-closure care permit for the cap maintenance and/or groundwater monitoring requirements is obtained.

The specific procedures and criteria for determining "clean" closure with respect to groundwater will be specified in the groundwater monitoring plan. The following procedures are outlined in more detail in the groundwater monitoring plan:

- For all monitoring wells, initial background concentrations of all designated monitoring parameters will be established based on quarterly sampling for 1 year.
- For each parameter on the "clean" closure list, specific statistical methods listed in the groundwater monitoring plan will be used to make statistical comparisons. The comparison will consider each of the wells individually in the monitoring system.

After the fifth quarter statistical comparison is performed, the following scenarios are possible:

- If "clean" closure with respect to both the soil and groundwater is achieved, then no further groundwater monitoring will be required.
- If the soils are determined "clean" closed and the groundwater is not "clean" closed, then the groundwater will have been determined to have been contaminated. Therefore, quarterly sampling of the groundwater will be required, pursuant to the VHWMR § 9.5.D, during the post-closure care period.
- If the soils are not clean closed and the groundwater is determined to be clean closed, then at least semiannually monitoring of the groundwater will be required pursuant to the VHWMR § 9.5.C, during the post-closure care period. In addition, a final cover system will be placed over the area to address non-clean closure of soils.

After five quarters, the frequency of groundwater sampling and analysis (if required) will be

determined by the VDEQ based on the closure scenarios noted above.

These procedures/criteria should also be contained in the groundwater monitoring plan for the incinerator spray pond closure. (The reader is referred to the separate Groundwater Monitoring Plan document for further details on the groundwater monitoring system and sampling/analytical protocols.

10. *Page 41 paragraph 3.12 Certification of Closure (VHWMR Section 10.6.F)*

Plan States:
"The independent engineer will be present during all closure activities"

Proposed Change:
"Closure activities will be monitored by a Professional Engineer."

DEQ Response:

Ok.

11. *Page 42 Table 3-5 Closure Schedule*

Proposed Change:
Use schedule submitted by Hercules in 1993 (Attached). The plan submitted by DEQ exceeds the scope of work estimated in 1993. Once the plan is firm RAAP must request funds from the Army for the increased scope. The original schedule took this in to account. The proposed schedule assumes that funding can be obtained in 45 days and that work can start before funding is received. This assumption is incorrect.

DEQ Response:

Ok. Please note the closure schedule should keep as much detail of the closure steps involved as possible. If extensions are needed during closure activities, then Radford may request an extension as provided by VHWMR, § 9.6.D.2. Please revise and resubmit as appropriate.

12. *Page 62 paragraph 4.12 Contingent Closure Schedule*

Comment:
The submitted schedule does not take into account the mechanisms required to establish a scope of work, obtain funding, secure approved drawings and specifications, advertise for bids, review the bids, mobilize a contractor, and begin work. The described effort can take as long as 120 days.

DEQ Response:

Ok. Please revise and resubmit the schedule with as much detail as possible, as stated in the previous response. Additionally, please revise the plan to also include an interim cap proposal which will minimize the time the excavation is open, such that rainwater will not carry hazardous

constituents into the groundwater. For example, if the clean closure attempt is abandoned, the area should be filled and regraded with clean soils to promote positive drainage and covered with a water barrier cover within several days of abandoning the clean closure attempt, as opposed to taking four months to draft specifications and plan sheets. Revise the closure schedule to realistically meet the needs and requirements of closure, while also revising the plan to indicate that an interim cap will be placed until the specifications and grading plan sheets are approved by VDEQ.

13. *Page 68 paragraph 6.0 Quality Assurance Quality Control (QA/ QC) Plan Introduction*

Comment.
This QA/QC plan is for a project that far exceeds the scope of this work effort.

DEQ response:

The Department does not agree that the QA/QC plan far exceeds the scope of the work that could be required if Radford abandons the clean closure attempt. The QA/QC plan contains detailed information and procedures to be used during the contingent closure plan implementation, and the design sheets and material specifications will reference and rely on the QA/QC document. The QA/QC plan helps to ensure that the construction of the cap is in accord with the design sheets and specifications. The design sheets and specifications will stipulate the cap shape and materials, and submittal of the design sheets and specifications is permitted after abandoning the clean closure attempt. Note that Radford may propose an alternative, equivalent cap design. Please note that a different cap configuration which provides a geo-composite membrane liner (GCL) would significantly reduce the QA/QC requirements and construction testing of the compacted clay. For example, the use of "claymax" to replace the two foot clay layer vastly simplifies construction and reduces QA/QC work. However, the use of an alternative cover requires different QA/QC efforts to ensure quality and correct placement. The cap design currently proposed in the closure plan is the design standard. Radford may abandon the clean closure attempt and close waste in-place using a cap which meets or exceeds the performance of the design standard currently written in the plan. Note that a for the design standard, the appendix QA/QC document is needed to ensure adequate construction methods. If Radford wishes to simplify or shorten the QA/QC document as written, an alternative cap would have to be proposed. If there are any specific problems with the QA/QC document, then those items can be modified as needed according to the VHWMR.

Please respond to the comments within 15 days of receipt of this letter, by revising the appropriate pages in the closure plan and resubmitting the plan or revised pages for further review. If there are any questions about these comments, or if additional time for re-submittal is needed, please do not hesitate to contact me at (804) 527-5107.

Sincerely,

Clifton L. Parker[IV]
Environmental Engineer Senior

cc: Jerome J. Redder, P.E., Alliant Techsystems, Inc.
Mary Beck, EPA Region III, 841 Chesnut Building, Philadelphia, PA 19109-4431
Glenn von Gonten, VDEQ
West Central Regional Office - Roanoke File
Central File

ALLIANT TECHSYSTEMS

Alliant Techsystems Inc.
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P.O. Box 1
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June 8, 1995

95-815-224

Department of Environmental Quality
Waste Division
4900 Cox Road
Glen Allen, VA 23060

Attention: Mr. Clifton L. Parker, IV

Subject: Incinerator Spray Pond Closure Plan
Correspondence from DEQ May 16, 1995

Reference: Department of Environmental Quality Letter dated May 16, 1995

Dear Mr. Parker:

In a telephone conversation with Mr. R. L. Richardson, ACO staff, he and yourself agreed that a response to the referenced letter could be delayed until the week of June 5, 1995. Since that time we have received under separate cover comments to RAAP's ground water monitoring plan for this site. A revised plan based on the comments is due to Mr. Glenn von Gonten July 1, 1995.

The enclosed closure plan, written by DEQ has been reviewed in detail at your request. We have the following comments:

1. Page 17 & 18 paragraph 3.5.1 Hazardous Constituents of Concern

   Comment:

   Testing for organics from the scrubber water from the incinerator is redundant. The incinerator is 99% efficient. The organics were treated in the incinerator and are not in the spray pond. The sludge that was removed from the pond tested positive only for lead. Also, is there a reason for 2,4 DNT and 2,6 DNT to be listed twice?

2. Page 16 paragraph 3.3 General Closure Approach

Closure plan states:

Rainwater has filled the pond since it was emptied in 1992.
Proposed change:

To ensure compliance with the VPDES permit, analysis will be performed for COD, Lead, and pH. Additional testing would not warrant any value for the money spent.

3. Page 18 paragraph 3.5.2 development of Cleanup Targets

Proposed Change:

RAAP will submit a revised Figure 2.5 describing background sampling locations. This figure will be submitted with the Groundwater Monitoring Plan due to DEQ July 1, 1995.

4. Page 19 paragraph 3.6.2 Concrete Liner and Bedding Material Removal

Closure Plan states:

Concrete and bedding material will be taken and tested for hazardous characteristic in accord with VHWMR Part III, and that concrete and bedding material will be disposed of in a permitted debris landfill.

Proposed Change and Comment:

The sludge was hazardous for lead (D008). Testing the concrete and bedding material for lead is sufficient for a hazardous determination. Concrete and bedding material, that is analyzed to be not hazardous, should be disposed of in accordance with VSWMR.

5. Page 27 paragraph 3.7.3 Initial Physical Observation of Subsoils and Excavation

Comment:

RAAP plans to use X ray fluorescence. If DEQ does not approve of this method of physical sampling please indicate.

6. Page 28 paragraph 3.7.4 Initial Random Sampling and Excavation

   Plan States:

   Surface samples will be collected using disposable stainless steel hand corers.

   Proposed Change:

   Surface samples will be collected using stainless steel hand corers.

7. Page 30 paragraph 3.7.5

   Plan States:

   Discuss Health Based Closure

   Proposed Change:

   RAAP will propose risk/health based closure criteria.

8. Page 31 paragraph 3.8.1 Sample Preservation and maximum Holding Times

   Plan States:

   Organic tests 4 ounce, (120ml) wide mouth glass with teflon liner

   Proposed Change:

   Organic tests 4 ounce, (120ml) wide mouth glass with teflon lined lid

9. Page 40 paragraph 3.11 Groundwater Closure

   Proposed Change:

   Delete paragraph in its entirety. The Groundwater Monitoring and closure plan currently under review by Glenn von Gonten, DEQ Hydrogeologist, should be referenced in this paragraph.

10. Page 41 paragraph 3.12 Certification of Closure (VHWMR Section 10.6.F)

Plan States:

"The independent engineer will be present during all closure activities"

Proposed Change:

"Closure activities will be monitored by a Professional Engineer."

11. Page 42 Table 3-5 Closure Schedule

Proposed Change:

Use schedule submitted by Hercules in 1993 (Attached). The plan submitted by DEQ exceeds the scope of work estimated in 1993. Once the plan is firm RAAP must request funds from the Army for the increased scope. The original schedule took this in to account. The proposed schedule assumes that funding can be obtained in 45 days and that work can start before funding is received. This assumption is incorrect.

12. Page 62 paragraph 4.12 Contingent Closure Schedule

Comment:

The submitted schedule does not take into account the mechanisms required to establish a scope of work, obtain funding, secure approved drawings and specifications, advertise for bids, review the bids, mobilize a contractor, and begin work. The described effort can take as long as 120 days.

13. Page 68 paragraph 6.0 Quality Assurance Quality Control (QA/QC) Plan Introduction

Comment:

This QA/QC plan is for a project that far exceeds the scope of this work effort.

Proposed Change:

RAAP suggests that the QA/QC plan be submitted with the plans and specifications required for contingent closure in the event that contingent closure becomes necessary.

Thank you for the opportunity to review the closure plan. Please contact Jerry Redder, Alliant Techsystems Environmental Engineer, to resolve the above comments and proposed changes.

Very truly yours,

C. A. Jake
Environmental Manager

Attachment

c: Mary Beck, EPA Region III
841 Chestnut Building
Philadelphia, PA 19109-4431

Lisa Ellis, VA-DEQ
West Central Regional Office
Executive Office Park Suite D
5338 Peters Creek Road
Roanoke, VA 24019

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Richmond, VA 23240-0009

/JJRedder

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

JAN 25 1995

Peter W. Schmidt
Director

P. O. Box 10009
Richmond, Virginia 23240-0009
(804) 762-4000

John R. Loyd
Lieutenant Colonel
Department of the Army
Radford Army Ammunition Plant
Radford, Virginia 24141-0298

Re: Second Modified Closure Plan for Surface Impoundment Unit #4
Facility EPA ID Number: VA1210020730

Dear Colonel Loyd:

Enclosed is the approved second modified closure plan for Surface Impoundment Unit #4 which addresses risk-based closure. Prior to 1993, the Virginia Hazardous Waste Management Regulations (VHWMR) did not allow for risk-based or health-based performance standards for clean closure. However, with Amendment 12 of the VHWMR (effective January 14, 1993) which deleted the definitions of "contaminant" and "contamination" from Part I, the Department now has the regulatory authority to approve alternate performance standards for closure. Prior to this time, the Department had relied upon these definitions to provide regulatory support for requiring background or non-detect levels as the performance standard.

Please review the approved modified closure plan carefully and respond within 15 days of receipt of this plan. If you have any questions regarding this matter, please contact Thomas H. Rodgers of my staff at (804) 527-5143.

Sincerely,

Hassan Vakili

Hassan Vakili, Director
Waste Operations

Enclosure

cc: Janice Bolden, EPA Region III
Debbie Miller, VDEQ-WD-OWMR